

1           1. A method of constructing a portfolio, the method  
2 comprising:

3           receiving target allocations for different types of  
4 assets;

5           receiving a list of investments available for  
6 inclusion in the portfolio; and

7           selecting investments from the list of investments  
8 based on a measure of the risk-adjusted excess return of  
9 selected investments and the received target allocations.

1           2. The method of claim 1 wherein the types of  
2 assets comprise at least one of the following: domestic  
3 stock funds, foreign stock funds, bonds, and short-term  
4 assets.

1           3. The method of claim 1 wherein the target  
2 allocations comprise target allocations corresponding to  
3 different target allocation categories.

1           4. The method of claim 3 wherein the target  
2 allocation categories comprise at least one of the  
3 following: a conservative category, a balanced category, a  
4 growth category, and an aggressive growth category.

1            5. The method of claim 1 further comprising  
2 determining the target allocations.

1            6. The method of claim 5 wherein the determining  
2 comprises categorizing an investor based on investor  
3 responses to questions.

1            7. The method of claim 1 wherein the measure of  
2 risk-adjusted excess return comprises an alpha measurement  
3 determined in accordance with:

$$R_t = \alpha + \beta_1 R_{1t} + \beta_2 R_{2t} + \dots + \beta_N R_{Nt} + \epsilon_t,$$

where

$\alpha$  = the risk adjusted excess return (alpha);

$R_t$  = the excess return of a fund in month  $t$ ;

$R_{kt}$  = the excess return of factor  $k$  in month  $t$  ( $k=1 \dots N$ );

$\beta_k$  = the  $\beta$  of factor  $k$  ( $k=1 \dots N$ );

$\epsilon_t$  = the tracking error in month  $t$ ;

1            8. The method of claim 1 further comprising  
2 determining weightings for the selected investments.

1            9. The method of claim 8 wherein determining  
2 weightings comprises determining weightings using

Minimize  $\lambda W^T H W - G^T W$

Subject  $\sum_{i=1}^N W_i = 1$

$Upper_{stock} \geq Stock\% \geq Lower_{stock}$

$Upper_{bonds} \geq Bonds\% \geq Lower_{bonds}$

$Upper_{cash} \geq Cash\% \geq Lower_{cash}$

$Upper_{foreign} \geq Foreign\% \geq Lower_{foreign}$

where

$W$  = weight matrix of fund tracking-error wrt the investment ben

$G$  = p-value of funds

$\lambda$  = risk aversion ratio

3 and

p-value = t-distribution (student t,  $n - p - 1$ )

student t =  $\frac{\alpha}{\sigma(\epsilon_t) / \sqrt{n-p}}$  = information ratio x  $\sqrt{n-p}$

Information ratio =  $\alpha / \sigma(\epsilon_t)$

where

$\alpha$  = average risk adjusted excess return during the period;

$\sigma(\epsilon_t)$  = tracking-error wrt the custom benchmark;

$n$  = number of observations;

$p$  = number of the independent random variables;

$n - p - 1$  = degrees of freedom in t-test;

- 1 10. The method of claim 1 wherein selecting
- 2 comprises selecting based on at least one of the following:
- 3 investment net assets, investment life-span, investment
- 4 turnover ratio, investment expense ratio, investment minimum
- 5 deposit requirement, and investment cash position.

1           11. The method of claim 1 wherein selecting  
2 comprises selecting based on a categorization of an  
3 investment.

1           12. The method of claim 11 wherein the  
2 categorization comprises an investment objective  
3 categorization.

1           13. The method of claim 11 wherein the selecting  
2 comprises selecting based on a style-category of an  
3 investment.

1           14. The method of claim 1 wherein selecting  
2 comprises selecting based on an  $R^2$  descriptive statistic  
3 indicating the consistency of an investment's risk-adjusted  
4 excess return measure.

1           15. The method of claim 1 further comprising  
2 evaluating the constructed portfolio.

1           16. The method of claim 15 wherein the evaluating  
2 the constructed portfolio comprises determining whether  
3 sector allocation of the constructed portfolio corresponds  
4 to a sector allocation of a market benchmark.

1           17. The method of claim 15 wherein the evaluating  
2 the constructed portfolio comprises determining whether the  
3 constructed portfolio is too heavily weighted to one of the  
4 selected investments.

1           18. The method of claim 15 wherein the evaluating  
2 the constructed portfolio comprises determining whether the  
3 constructed portfolio is insufficiently weighted to one of  
4 the selected investments.

1           19. The method of claim 15 further comprising  
2 constructing a different portfolio.

1           20. The method of claim 19 wherein constructing a  
2 different portfolio comprises constructing a different  
3 portfolio after modifying the target asset allocations.

1           21. The method of claim 1 further comprising  
2 provided a report describing the constructed portfolio.

1           22. The method of claim 1 further comprising  
2 receiving a target allocation to company stock.

1           23. The method of claim 22 further comprising  
2 adjusting the received target allocations for different

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3 types of assets based on the received portfolio allocation  
4 to company stock.

1 24. The method of claim 23 wherein the adjusting  
2 the target allocations for different types of assets  
3 comprises adjusting the target allocations such that the  
4 target allocations and the allocation to company stock have  
5 an associated risk level substantially the same as a risk  
6 level associated with a portfolio not having an allocation  
7 to company stock.

1 25. A method of constructing a portfolio, the  
2 method comprising:  
3 receiving target allocations for different types of  
4 assets, the types of assets comprising domestic stock funds,  
5 foreign stock funds, bonds, and short-term assets;  
6 receiving a list of investments available for  
7 inclusion in the portfolio;  
8 screening the list of investments;  
9 selecting and weighting investments from the  
10 screened list of investments based on a measure of the risk-  
11 adjusted excess return of selected investments and the  
12 received target allocations, the measure of risk-adjusted  
13 excess return comprising an alpha measurement determined in  
14 accordance with:

$$R_t = \alpha + \beta_1 R_{1t} + \beta_2 R_{2t} + \dots + \beta_N R_{Nt} + \epsilon_t,$$

where

$\alpha$  = the risk adjusted excess return (alpha);

$R_t$  = the excess return of a fund in month  $t$ ;

$R_{kt}$  = the excess return of factor  $k$  in month  $t$  ( $k=1 \dots N$ );

$\beta_k$  = the  $\beta$  of factor  $k$  ( $k=1 \dots N$ );

$\epsilon_t$  = the tracking error in month  $t$ ;

15 ,

16 the weightings determined using

Minimize  $\lambda W^T H W - G^T W$

Subject  $\sum_{i=1}^N W_i = 1$

$Upper_{stock} \geq Stock\% \geq Lower_{stock}$

$Upper_{bonds} \geq Bonds\% \geq Lower_{bonds}$

$Upper_{cash} \geq Cash\% \geq Lower_{cash}$

$Upper_{foreign} \geq Foreign\% \geq Lower_{foreign}$

where

$W$  = weight matrix of fund tracking-error wrt the investment ben

$G$  = p-value of funds

$\lambda$  = risk aversion ratio

17 and

$p$ -value =  $t$ -distribution (student  $t, n - p - 1$ )

student  $t = \frac{\alpha}{\sigma(\epsilon_t) / \sqrt{n-p}} = \text{information ratio} \times \sqrt{n-p}$

Information ratio =  $\alpha / \sigma(\epsilon_t)$

where

$\alpha$  = average risk adjusted excess return during the period;

$\sigma(\epsilon_t)$  = tracking-error wrt the custom benchmark;

$n$  = number of observations;

$p$  = number of the independent random variables;

$n - p - 1$  = degrees of freedom in t-test;

1           26. A computer program product, disposed on a  
2 computer readable medium, for constructing a portfolio, the  
3 computer program product including instructions for causing  
4 a processor to:

5           receive target allocations for different types of  
6 assets;

7           receive a list of investments available for  
8 inclusion in the portfolio; and

9           select investments from the list of investments  
10 based on a measure of the risk-adjusted excess return of  
11 selected investments and the received target allocations.

1           27. The computer program product of claim 26  
2 wherein the types of assets comprise at least one of the  
3 following: domestic stock funds, foreign stock funds, bonds,  
4 and short-term assets.

1           28. The computer program product of claim 26  
2 wherein the target allocations comprise target allocations  
3 corresponding to different target allocation categories.



1           29. The computer program product of claim 28  
2 wherein the target allocation categories comprise at least  
3 one of the following: a conservative category, a balanced  
4 category, a growth category, and an aggressive growth  
5 category.

1           30. The computer program product of claim 26  
2 wherein the measure of risk-adjusted excess return comprises  
3 an alpha measurement determined in accordance with:

$$R_t = \alpha + \beta_1 R_{1t} + \beta_2 R_{2t} + \dots + \beta_N R_{Nt} + \epsilon_t,$$

where

$\alpha$  = the risk adjusted excess return (alpha);

$R_t$  = the excess return of a fund in month  $t$ ;

$R_{kt}$  = the excess return of factor  $k$  in month  $t$  ( $k=1 \dots N$ );

$\beta_k$  = the  $\beta$  of factor  $k$  ( $k=1 \dots N$ );

$\epsilon_t$  = the tracking error in month  $t$ ;

1           31. The computer program product of claim 26  
2 further comprising instructions for causing the processor to  
3 determine weightings for the selected investments.

1           32. The method of claim 31 wherein the instructions  
2 for determining weightings comprises instructions for  
3 determining weightings using

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$$\text{Subject} \sum_{i=1}^N W_i = 1$$
$$Upper_{stock} \geq Stock\% \geq Lower_{stock}$$
$$Upper_{bonds} \geq Bonds\% \geq Lower_{bonds}$$
$$Upper_{cash} \geq Cash\% \geq Lower_{cash}$$
$$Upper_{foreign} \geq Foreign\% \geq Lower_{foreign}$$

where

$W$  = weight matrix of fund tracking-error wrt the investment ben

$G = p\text{-value of funds}$

 $\lambda = \text{risk aversion ratio}$ 

4 and

$p\text{-value} = t\text{-distribution}(\text{studentt}, n - p - 1)$

$$\text{student } t = \frac{\alpha}{\sigma(\epsilon_t) / \sqrt{n-p}} = \text{information ratio} \times \sqrt{n-p}$$
$$\text{Information ratio} = \alpha / \sigma(\epsilon_t)$$

where

$\alpha$  = average risk adjusted excess return during the period;

$\sigma(\epsilon_t)$  = tracking-error wrt the custom benchmark;

$n$  = number of observations;

$p$  = number of the independent random variables;

$$\bar{n} - p - 1 = \text{degrees of freedom in } t\text{-test};$$

1           33. The computer program of claim 26 wherein the  
2 instructions for selecting comprise instructions for  
3 selecting based on at least one of the following: investment  
4 net assets, investment life-span, investment turnover ratio,

5 investment expense ratio, investment minimum deposit  
6 requirement, and investment cash position.

1 34. The computer program of claim 26 wherein the  
2 instructions for selecting comprise instructions for  
3 selecting based on a categorization of an investment.

1 35. The computer program product of claim 26  
2 wherein the instructions for selecting comprise instructions  
3 for selecting based on an  $R^2$  descriptive statistic  
4 indicating the consistency of an investment's risk-adjusted  
5 excess return measure.

1 36. The computer program product of claim 26  
2 further comprising instructions for evaluating the  
3 constructed portfolio.

1 37. The computer program product of claim 36  
2 wherein the instructions for evaluating the constructed  
3 portfolio comprise instructions for determining whether  
4 sector allocation of the constructed portfolio corresponds  
5 to a sector allocation of a market benchmark.

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1           38. The computer program product of claim 26  
2 further comprising instructions for modifying the target  
3 asset allocations.

1           39. The computer program product of claim 26  
2 further comprising instructions for receiving a target  
3 allocation to company stock.

1           40. The computer program product of claim 39  
2 further comprising instructions for adjusting the received  
3 target allocations for different types of assets based on  
4 the received portfolio allocation to company stock.

1           41. The computer program product of claim 40  
2 wherein the adjusting the target allocations for different  
3 types of assets comprises adjusting the target allocations  
4 such that the target allocations and the allocation to  
5 company stock have an associated risk level substantially  
6 the same as a risk level associated with a portfolio not  
7 having an allocation to company stock.

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